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Earth Science Data Systems (ESDS) Program, HQ SMD

Spaceborne Mission/Instrument Science Data Requirements

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**Headquarters
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National Aeronautics and
Space Administration

Program-Level Requirements Appendix (PLRA) Spaceborne Mission/Instrument – Science Data Requirements

The Program-Level Requirements Appendix (PLRA) is an appendix to the Flight Element (Earth Systematic Mission (ESM) or Earth System Science Pathfinder (ESSP)) Program Plan. The PLRA identifies the Level 1 mission, science, and programmatic requirements for the development and operation of the science mission/instrument. Section 4.5 of the PLRA identifies the Level 1 mission science data requirements.

Spaceborne Mission/Instrument – Science Data Requirements

4.5 MISSION DATA REQUIREMENTS

4.5.1 SCIENCE DATA MANAGEMENT

- a) The <<project name>> shall produce the standard science data products listed in Table 4.5.1. Standard data products are fully validated against Level 1 requirements.
- b) All data and the standard science data products listed in Table 4.5.1, along with the scientific source code for algorithm software, coefficients, and ancillary data used to generate these products shall be delivered to the <<designated NASA Earth Science Division-assigned Distributed Active Archive Center (DAAC)(s)>> in accordance with the NASA Earth Science Data and Information Policy specified at <https://science.nasa.gov/earth-science/earth-science-data/data-information-policy/>.
- c) Public release of these data shall conform to the NASA Earth Science Data and Information Policy.
- d) There shall be no period of exclusive access.
- e) All source code used to generate the standard products listed in Table 4.5.1 shall be developed in accordance with the NASA Earth Science Open Source Policy at <https://earthdata.nasa.gov/earth-science-data-systems-program/policies/esds-open-source-policy>.
- f) The source code shall be delivered to DAAC(s) at the time of the initial data delivery specified in Table 4.5.1.
- g) Updated source code shall be delivered to DAAC(s) throughout the lifetime of the project as new versions of software are developed.
- h) Science algorithms used to generate the standard science data products listed in Table 4.5.1 shall be documented in Algorithm Theoretical Basis Documents (ATBDs) and delivered to DAAC(s) at the time of the initial data delivery.
- i) Documents listed in Table 4.5.2 shall be delivered to the DAAC and updated per the schedule in the table.
- j) Updated ATBDs shall be delivered to DAAC(s) throughout the lifetime of the project.
- k) The <<project name>> shall coordinate with the <<designated NASA Earth Science Division-assigned Data Center(s)>> the release of product versions, to ensure completeness and accuracy of quality information, validation status, and metadata of the <<project/instrument name(s)>> science data products.
- l) The <<project name>> shall coordinate with the <<designated NASA Earth Science Division-assigned Data Center(s)>> on the data and information to be transferred at <<project name>> closeout.

4.5.1.1 SCIENCE DATA REQUIREMENTS

- a) The <<project/instrument name(s)>> science data product formats shall conform to the <<standard selected from the ESD-approved Data System Standards - <https://earthdata.nasa.gov/about-eosdis/requirements>>>.
- b) The <<project/instrument name(s)>> science data products metadata shall conform to ISO 19115 Geographic Information - Metadata standards and adhere to the Metadata Requirements – Base Reference for NASA Earth Science Data Products document published at <https://earthdata.nasa.gov/about-eosdis/requirements>, and the <<project name>> shall baseline to a specific initial version before launch.
- c) For all standard data products that can be meaningfully represented as images, <<project name>> shall generate full-resolution browse products, as defined in <https://earthdata.nasa.gov/about/science-system-description/eosdis-components/global-imagery-browse-services-gibs>
- d) The <<project name>> shall transfer to the <<designated NASA Earth Science Division-assigned DAAC(s)>> all the information and documentation required for long-term preservation of knowledge about the products resulting from <<project name>>, as defined in the NASA Earth Science Data Preservation Content Specification document published at <https://earthdata.nasa.gov/about-eosdis/requirements> and shall baseline to a specific initial version.

Additional requirements may be added to this section to provide greater specificity to the science data requirements.

Table 4.5.1. <<project name>> Data Products

Data Product	Description	First data delivery after IOC	Maximum data latency after first release
Level 1	<<Level 1 description>>	<x months>	<a hours, days>
Level 2	<<Level 2 description>>	<y months>	<b hours, days>
Level 3	<<Level 3 description>>	<z months>	<c hours, days>

Delivery in Table 4.5.1 refers to the delivery of data from the Science Processing System to the DAAC and is not the public release date. The details shall be jointly determined by the project, Program Scientist, and ESD Data Systems Manager. Note – the data delivery schedule shall be established such that there is NO period of exclusive access to the data.

Table 4.5.2. <<project name>> Milestones Related to Science Data, Metadata and Documentation

(NOTE: This table may be more appropriate in project plan or elsewhere. In the event this table will be included outside of the PLRA please document the location)

Item	Description	Deliver to	Delivery Schedule
ESDIS-Flight Project Inter-Project Agreement	Agreement outlining respective projects' responsibilities regarding science data production, archiving and distribution	PE for ESDS	At or before KDP-B
Preliminary Data Management Plan (DMP)	Initial version of document following guidance at https://science.nasa.gov/earth-science/earth-science-data/data-management-plan-guidance/	PE for ESDS and Program Scientist	2 months before KDP-C
ATBD	Algorithm Theoretical Basis Documents for products indicated in table 4.5.1.	Program Scientist	3 months before KDP-C
DMP	Baseline version of DMP following https://science.nasa.gov/earth-science/earth-science-data/data-management-plan-guidance/	PE for ESDS and Program Scientist	2 months before ORR
DAAC Interface Control Document	ICD between <<Project's>> science data processing system and the ESD-assigned DAAC	ESDIS Project	KDP-D
Preservation Content Identification	List of items compatible with Preservation Content Specification (at https://earthdata.nasa.gov/about-eosdis/requirements)	ESD-Assigned DAAC	KDP-E
Processed and/or reprocessed data products	Standard Products listed in table 4.5.1	ESD-Assigned DAAC	On-going during Operations Phase after initial data delivery indicated in table 4.5.1
Product Quality Assessment	Information about quality of data products as they are generated and assessed; data quality guides and updates	ESD-Assigned DAAC	On-going during Operations Phase after initial data delivery indicated in table 4.5.1
Source code	Source code implementing product generation algorithms	ESD-Assigned DAAC	With initial data delivery and update each time a new version is used
Preservation Content	All project related and science data	ESD-	At Project closeout

	related preservation content as specified in Preservation Content Specification (at https://earthdata.nasa.gov/about-eosdis/requirements)	Assigned DAAC	
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4.5.2 APPLIED SCIENCE DATA REQUIREMENTS

Beginning in Phase C, the <<project name>> shall organize and host a <<instrument/project name>> data product application workshop annually. The workshop will share information on <<instrument/project name>> science data applications and define potential applications that can be supported with existing <<project name>> data requirements. Results will be provided to the <<project name>> science team and at other <<project name>> workshops and meetings.

Appendix A Abbreviations and Acronyms

ATBD	Algorithm Theoretical Basis Document
DAAC	Distributed Active Archive Center
DMP	Data Management Plan
ESD	Earth Science Division
ESDS	Earth Science Data Systems Program
ESDIS	Earth Science Data Information System
ESM	Earth Systematic Mission
ESSP	Earth System Science Pathfinder Program
IOC	Instruments Operations Checkout
ICD	Interface Control Document
KDP	Key Decision Point
PE	Program Executive